ESDALCL6-2SC6

Very low capacitance and low leakage current ESD protection

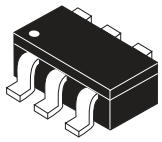
Datasheet – production data

Features

- 2 data-line protection
- Protects V_{BUS}
- Very low capacitance: 2.5 pF typ.
- Very low leakage current:
  - 10 nA at 3 V
  - 1 nA at 1 V
- RoHS compliant

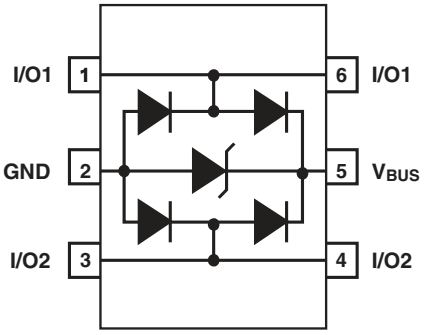
Complies with the following standards:

- IEC 61000-4-2 level 4 and higher:
  - 30 kV (air discharge)
  - 15 kV (contact discharge)
- MIL STD883G-Method 3015-7
  - 25 kV (human body model)



SOT23-6L
ESDALCL6-2SC6

Figure 1. Functional diagram (top view)



Applications

- USB 2.0 ports up to 480 Mb/s (high speed)
- Compatible with USB 2.0
- Ethernet port: 10/100 Mb/s
- SIM card protection
- Video line protection
- Portable healthcare equipment

Description

The ESDALCL6-2SC6 is a monolithic application specific device dedicated to ESD protection of high speed interfaces, such as USB 2.0, ethernet links and video lines.

The very low line capacitance secures a high level of signal integrity without compromising in protecting sensitive chips against the most stringently characterized ESD strikes.

Its low leakage current makes it suitable for portable equipment.

1 Characteristics

Table 1. Absolute ratings

Symbol	Parameter		Value	Unit
V_{PP}	Peak pulse voltage	IEC 61000-4-2 air discharge IEC 61000-4-2 contact discharge MIL STD883G-Method 3015-7	30 15 25	kV
T_{stg}	Storage temperature range		-55 to +150	°C
T_j	Operating junction temperature range		-40 to +125	°C
T_L	Lead solder temperature (10 seconds duration)		260	°C

Table 2. Electrical characteristics (T_{amb} = 25 °C)

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{BR}	I_R = 1 mA		6			V
I_{RM}	V_{RM} = 3 V, V_{CC} to GND				10	nA
	V_{RM} = 1 V, V_{CC} to GND				1	
V_F	Forward voltage	I_F = 10 mA			1.1	V
V_{CL}	Clamping voltage	I_{PP} = 1 A, 8/20 µs Any I/O pin to GND			12	V
		I_{PP} = 5 A, 8/20 µs Any I/O pin to GND			17	V
$C_{i/o-GND}$	Capacitance between I/O and GND	V_R = 1.65 V		2.5	3.5	pF
$\Delta C_{i/o-GND}$				0.015		
$C_{i/o-i/o}$	Capacitance between I/O	V_R = 1.65 V		1.2	1.7	pF
$\Delta C_{i/o-i/o}$				0.04		

Figure 2. Capacitance versus voltage (typical values)

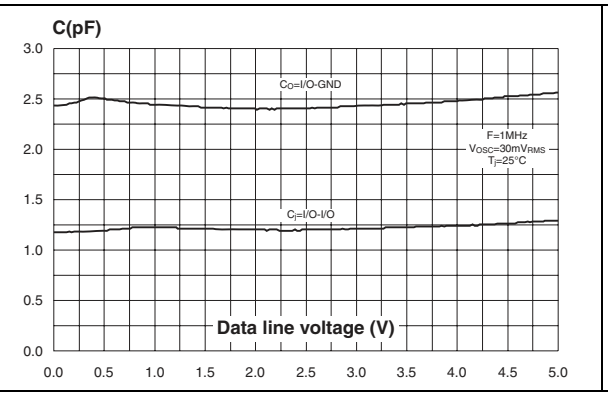


Figure 3. Line capacitance versus frequency (typical values)

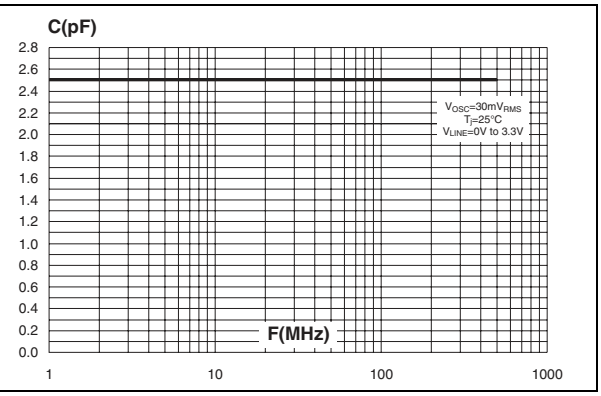


Figure 4. Leakage current versus junction temperature (typical values, V_R = 1 V)

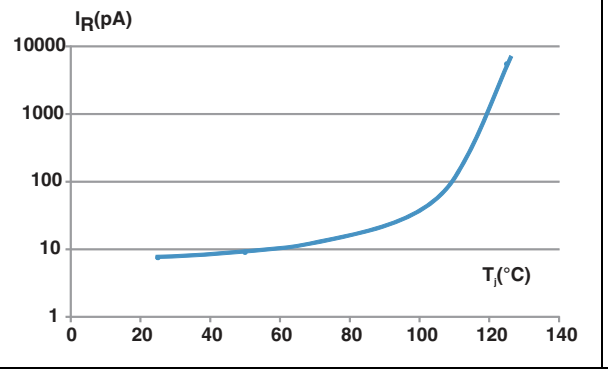


Figure 5. Leakage current versus reverse applied voltage (typical values)

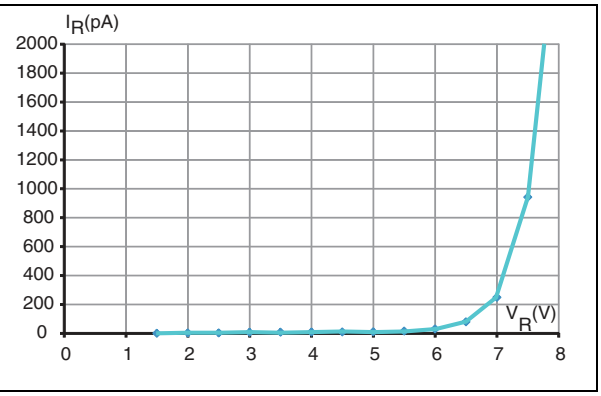


Figure 6. ESD response to IEC 61000-4-2 (+8 kV contact discharge)

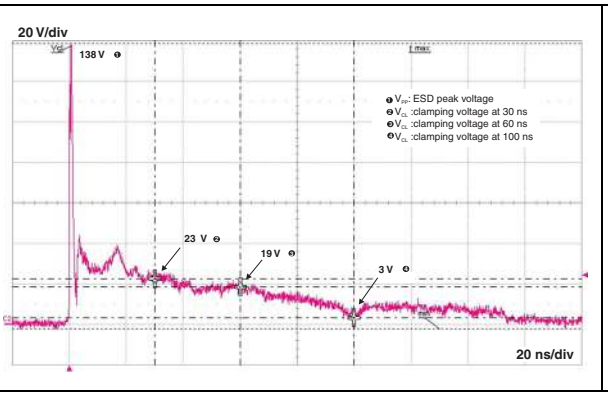


Figure 7. ESD response to IEC 6100-4-2 (-8 kV contact discharge)

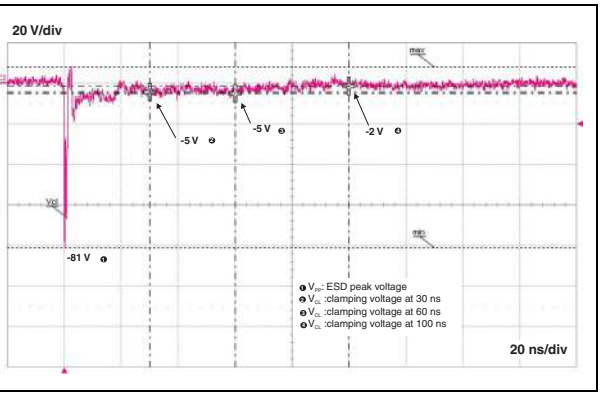


Figure 8. S21 attenuation measurement result

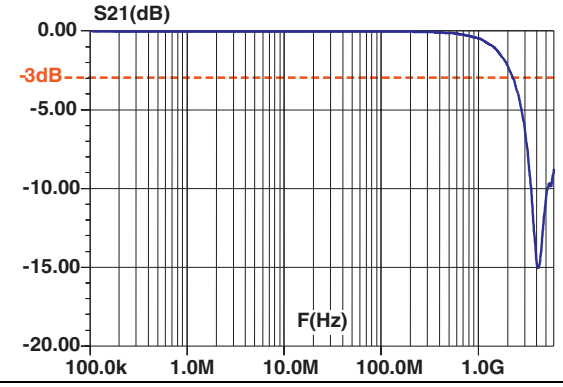
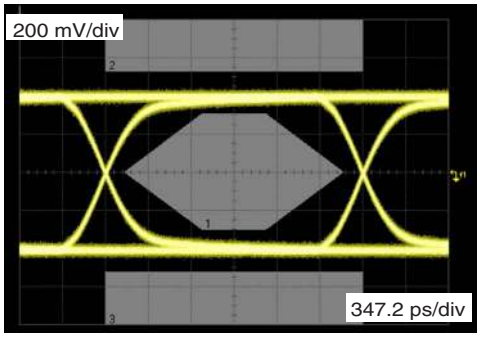
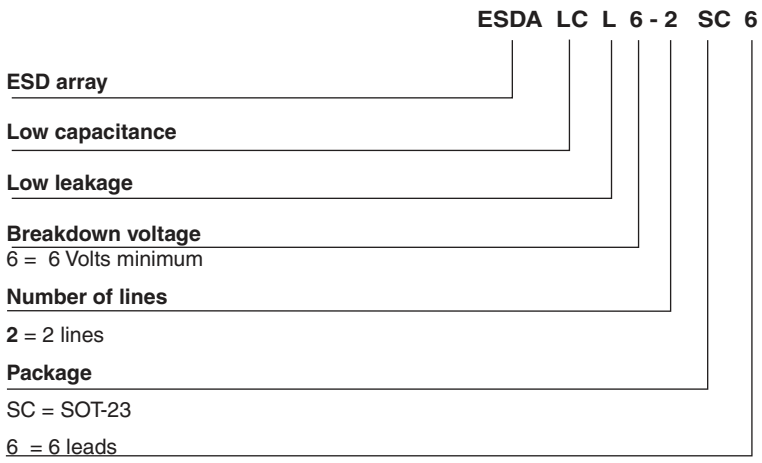


Figure 9. USB2.0 eye diagram



2 Ordering information scheme

Figure 10. Ordering information scheme

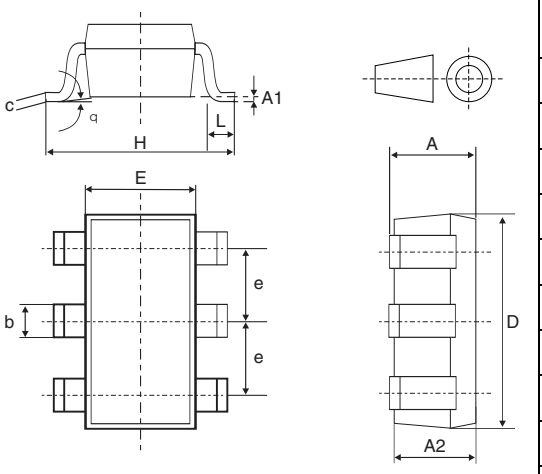


3 Package information

- Epoxy meets UL94, V0
- Lead-free packages

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK® is an ST trademark.

Table 3. SOT23-6L dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.45	0.035		0.057
A1	0		0.15	0		0.006
A2	0.90		1.30	0.035		0.051
b	0.30		0.50	0.012		0.020
c	0.09		0.20	0.004		0.008
D	2.80		3.05	0.11		0.118
E	1.50		1.75	0.059		0.069
e		0.95			0.037	
H	2.60		3.00	0.102		0.118
L	0.30		0.60	0.012		0.024
θ	0°		10°	0°		10°

Figure 11. SOT23-6L footprint dimensions in mm

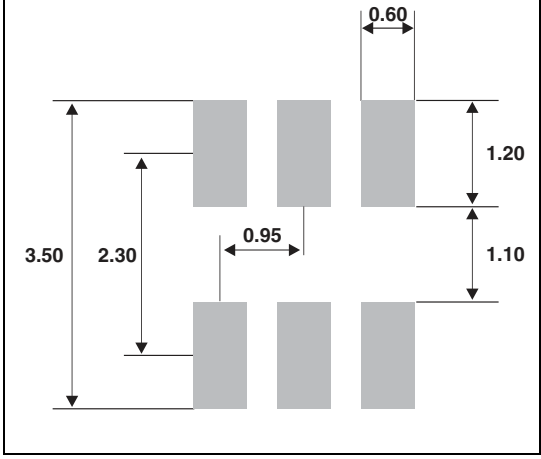
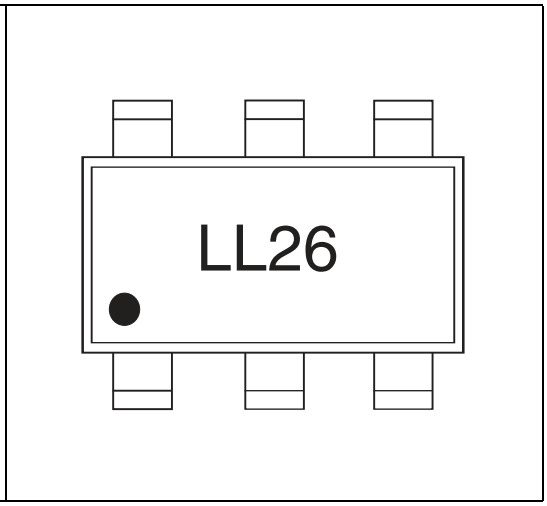


Figure 12. SOT23-6L marking



4 Ordering information

Table 4. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
ESDALCL6-2SC6	LL26	SOT23-6L	16.7 mg	3000	Tape and reel

5 Revision history

Table 5. Document revision history

Date	Revision	Changes
31-Oct-2012	1	First issue.

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